Texas Buffers for Wildlife

United States Department of Agriculture

Natural Resources Conservation Service

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Riparian Forest Buffer

Conservation Buffer Job Sheet 391

Definition

A riparian forest buffer is a corridor of trees, shrubs, and herbaceous vegetation located adjacent to streams, lakes, ponds, and wetlands.

Purpose

This supplement to the national job sheet is designed to assist with integrating wildlife habitat prescriptions into planning riparian forest buffers. The wildlife habitat components that can be provided by a riparian forest buffer include nesting cover, fawning areas, feeding cover, escape cover, travel corridors between habitats, and critical resting stops for migratory songbirds during spring and fall migration. In addition to water quality protection, a riparian forest buffer can provide shade, organic matter, and large woody debris important to fish and their aquatic food chain. Many species of wildlife native to Texas, such as white-tailed deer, wild turkeys, cardinals, woodpeckers, great horned owls, turtles, frogs, and insects will use the riparian habitat provided by this common agricultural conservation practice.

Site Considerations

- Landowner objectives (specific types of wildlife or wildlife habitat desired, agricultural use, etc.)
- Adjacent waterbody use (e.g. recreation, fishing, etc.
- Upland conditions and practices affecting riparian functions
- Soil characteristics (texture, depth, moisture, slope, etc.)
- Stream order
- Annual rainfall
- Plant hardiness zone
- Connection to other wildlife habitats

Design Considerations

Each riparian forest buffer should consist of three zones: Zone 1 consists of riparian trees and shrubs adjacent to the waterbody and extends approximately 15 feet. Zone 1 should provide a stable area near the water's edge to facilitate nutrient buffering, provide shade to stabilize water temperatures, and contribute detritus and woody debris to the stream ecosystem. Zone 2 will be up-gradient of zone 1 and consist of riparian trees and shrubs designed to provide contact time for the buffering process to occur, establish wildlife habitat, and improve aesthetics. Periodic timber harvesting and other management activities may be specified in Zone 2. Zone 3

is a filter strip up-gradient of zone 2 designed to convert concentrated flow to uniform sheet flow and to provide a soft transition between the trees and the adjoining cropland, pastureland, urban area or farmstead.

Alternatives can vary from simple, when creating habitat where wildlife is not the landowner's primary objective, to complex when designing and managing riparian forest buffers for specific wildlife such as songbirds, raptors, bobwhite quail or white-tailed deer. The habitat contribution of a riparian forest buffer is determined by the vegetation selected, the width of the buffer, and the maintenance/management techniques selected. Ideally the trees, shrubs, and herbaceous plants used in a riparian forest buffer should mimic those that occurred naturally on the site, but a number of alternatives are available to meet the landowner's wildlife objectives and economic concerns. Although Zone 3 is not always required in a riparian forest buffer, it should be included in all designs with a wildlife objective. The addition of this filter strip, composed of native shrubs, grasses, legumes, and forbs, adds vegetation complexity and a transition zone to the buffer.

Recommended Width

Additional width is important when designing a riparian forest buffer for wildlife. Wider riparian corridors provide nesting habitat for a greater variety of migratory songbirds and are more attractive to larger animals such as the white-tailed deer and wild turkey.

	Minimum	Optimum
General wildlife diversity	35 feet	150 feet
Non-game birds and mammals	35 feet	150 feet
Upland game	35 feet	75 feet
Waterfowl (cavity-nesting)	35 feet	300 feet
Big game	35 feet	200 feet
Aquatic species	35 feet	150 feet
Reptiles & amphibians	35 feet	150 feet
Raptors		≥300 feet

Vegetation

See the Texas supplement to conservation practice standard 645, Upland Wildlife Management and Plant Materials Fact Sheets for conservation practice standard 391, Riparian Forest Buffer, 580, Streambank and Shoreline Protection, and 393, Filter Strips to select trees, shrubs, grasses, forbs, and legumes that are beneficial to wildlife.

Simple Option

Plant a mixture of native trees and shrubs suited to the site conditions. Zone 1, nearest the waterbody, should have a minimum of 2 species planted in alternating rows. Zone 2 should be planted with 4 to 5 species that provide food and shelter for wildlife. The species can be planted in alternating rows or small blocks. Zone 3 should follow the design options recommended for filter strips with the shrubs planted in a row near Zone 2 or in blocks

or

Allow the riparian forest buffer to grow up in native plants, if suitable species for targeted wildlife are available in the seed bank. When using this option, specific vegetation management will have to be planned in order to comply with the standard. On areas subject to erosion, a dead litter cover crop should be sown to protect the soil until the vegetation becomes established.

Complex Option

A more naturalistic approach to the planting scheme will speed restoration of the riparian area, enhance wildlife habitat, and be more aesthetically pleasing. This can be accomplished by using as many different native plants as practical, that are adapted to the site, and planting in either small groupings or distributing species randomly in Zones 1 and 2. The combination of deciduous (oaks, hackberry, etc.) and evergreen (pine) trees and shrubs (plum, cedar, holly, wax myrtle, etc.) will result in a riparian area that can provide acorns as well as fleshy fruits (plums, holly berries, dogwood, etc.) for songbirds, deer, and turkeys. The establishment of grasses, forbs, legumes, and additional shrubs in Zone 3 will be beneficial to edge species such as bobwhite quail and cardinals. Leaving several rows of standing crops adjacent the riparian forest buffer will enhance fall and winter food.

or

Allow the forest riparian buffer to grow up in native plants, if suitable species for targeted wildlife are available in the seed bank. When using this option, specific vegetation management will have to be planned in order to comply with the standard. On areas subject to erosion, a dead litter cover crop should be sown to protect the soil until the vegetation becomes established.

To further enhance the value of a riparian forest buffer, planning and designing small, shallow depressions that hold runoff from the adjoining fields and/or overbank flow can provide a temporary water source and additional habitat that will benefit a greater diversity of wildlife species. The addition of such areas will require more careful selection of trees and shrubs to insure that those established around the wetter area are adapted to the planned conditions.

Establishment specifications are as follows:

1. Trees and shrubs may be cuttings, bareroot or container grown stock. Order plants in spring or summer prior to planting season to insure availability.
2. Site preparation for Trees and shrubs may be accomplished by disking, mowing or labeled herbicide treatment. Planting of trees and shrubs may be accomplished by machine or hand planting. Erosion control during the establishment period must be considered with any planting operation.
3. Fertilizer is not necessary for new plantings, as it may stimulate competition that can compete for light and moisture.
4. Planting stock must be protected from drying out and warm temperatures and planted between November 1 and March 15.
5. Certain (pesticides) herbicides and insecticides may be specified for application as needed to facilitate tree and shrub establishment. When these pesticides are applied, the
6. participant is responsible for assuring that all application rates and methods are consistent with label directions and that all required record keeping is maintained.
7. Temporary exclusion of recreation, livestock, and some wildlife may be required until the desired vegetation is established.

Maintenance/Management

In order to maximize wildlife benefits over the life of the practice, periodic management practices may need to be implemented. This can include cultural practices such as light disking, prescribed burning, mowing, re-seeding, prescribed grazing, and spot herbicide treatment. Management practices and implementation timing are generally dictated by local conditions, vegetation structure, and habitat conditions desired.

Maintenance/Management specifications are as follows:

1. Prescribed burning is a management option where pine or mixed pine/hardwood is established in Zone 2. Shrub plantings may need to be protected during prescribed burning. Prescribed burning should be scheduled at 2-5 year intervals based on the wildlife objectives. The participant will be responsible for obtaining a Prescribed Burn Plan and adhering to all local and state laws applicable to open burning.
2. Periodic harvesting of trees and shrubs in Zones 1 and 2 may be necessary to maintain the vegetative species composition and structure required to provide habitat for the targeted wildlife.
3. After establishment, dead trees should be left to provide food and shelter for birds and mammals and to eventually to recruit large woody material into the water body.
4. Livestock should be excluded from Zones 1 and 2 except for designed stream crossings and watering sites.
5. Management of Zone 3 to enhance wildlife habitat should follow the guidelines in the Filter Strip Jobsheet.

SPECIFICATIONS

Riparian Forest Buffer- Specification Sheet

Landowner _____ Field Number_____

Purpose (check all that apply)	
[] Wildlife Habitat	[] Intercept sediment, nutrients, pesticides, & other contaminants
[] Lower water temperature	[] Other (specify)

Location and Layout
Water body/course type and name, other:

Minimum buffer zone widths (ft) – specify left and right of stream (facing upstream) for two-sided buffer; use left only for water bodies such as lakes and ponds; include herbaceous species in zone 3 notes or refer to other jobsheets:		
Zone 1	**Zone 2**	**Zone 3**
Left: Right:	Left: Right:	Left: Right:
Notes:	Notes:	Notes(refer to filter strip jobsheet):
Buffer zone length (ft):	Buffer zone area (ac):	

Additional location and layout requirements:

Woody Plant Materials Information				
Species/cultivars: Spacing:	Plants/acre:	Kind of stock:	Planting dates	Average
Zone #1				
1				
2				
3				
4				
Zone #2				
1				
2				
3				
4				
5				

Temporary Storage Instructions
Planting stock that is dormant may be stored temporarily in a cooler or protected area. For stock that is expected to begin growth before planting, dig a V-shaped trench (heeling-in bed) sufficiently deep and bury seedlings so that all roots are covered by soil. Pack the soil firmly and water thoroughly.
Site Preparation
Remove debris and control competing vegetation to allow enough spots or sites for planting and planting equipment. Additional requirements:
Planting Methods
For container and bareroot stock, plant stock to a depth even with the root collar in holes deep and wide enough to fully extend the roots. Pack the soil firmly around each plant, Cuttings are in moist soil with at least 2 to 3 buds showing above ground. Additional requirements:
Buffer Maintenance
The buffer must be inspected periodically and protected from damage so proper functions are maintained. Replace dead or dying tree and shrub stock and control competing vegetation to allow proper establishment. After trees are established leave dead trees for wildlife feeding and shelter and recruitment of wood into the waterbody. Periodic harvesting may be necessary to maintain health and vigor and to allow sunlight to forest floor. Additional requirements:

RIPARIAN FOREST BUFFER - JOB SKETCH

If needed, an aerial view of the vegetation types, widths of zones 1, 2, and 3 (as applicable to the site), a sketch of a random planting scheme, a direction arrow, and the type of water body or water course are shown below. Other relevant information, such as shoreline or bank shape, upslope field conditions (including crop type), complementary practices, and additional buffer specifications may also be included.

Scale 1"= _____ ft. (NA indicates sketch not to scale: grid size= 1/2" by 1/2")

Additional Specifications and Notes:

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